IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Benjamin R. Mattes	Docket No.:	SFST.01USU1
Application No.:	10/672,323	Examiner:	Leo B. Tentoni
Filed:	September 26, 2003	Group Art Unit:	1791

For: SPINNING, DOPING, DEDOPING, AND REDOPING POLYANILINE FIBER

Mail Stop Appeal Brief - Patents
Assistant Commissioner for Patents
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REPLY BRIEF

Honorable Board of Appeals:

Appellants respond to the Examiner's Answer dated May 14, 2008 as follows:

REMARKS

In Section (10), Response to Argument, the Examiner stated that:

1. Appellants emphasize (page 9) that instant claim 7 recites adding between 6 and 14 mass% of a mixture of AMPSA and polyaniline containing between 2 and 12 mass% water to DCAA such that there are between 30 and 100 molecules of AMPSA per 100 aniline repeat units of polyaniline (i.e., between 30 and 100% doping of the polyaniline) while the temperature does not rise above 35°C, in order to retard gelation of the solution and allow for wet spinning of the solution (citing page 11, lines 13-21 of the instant specification), but that the mass percentages would have been obvious to one of ordinary skill in the art at the time the invention was made in the process of Adams et al. principally because Adams et al. teaches 60% doping of the polyaniline (the instant process recites between 30 and 100% doping) and to provide compositions which are capable of use in a wet spinning process (since Adams et al. teaches a wet spinning process, Adams et al. would also be interested in having a solution which is not gelated and which could be wet-spun) in order to manufacture conductive fibers made from polyaniline.

The Examiner continued that Adams et al. on page 4, lines 2-6 and 16-24, teaches that the polyaniline/AMPSA/DCAA mixture may contain additional solvents or diluents, including water.

Turning now to page 4, lines 2-6 and 16-24 of Adams et al., appellants wish to point out that although the first recitation mentions diluents, there is no teaching of what such diluents might be. Further, the second recitation, Adams et al. are discussing competitive solvents, and mention further that water may be too effective for some processes. A competitive solvent causes precipitation of the polymer as is stated in lines 25-30 of Adams et al. Therefore, there is no teaching or implication in Adams et al. that water can be mixed with the any of polyaniline, AMPSA or dichloroacetic acid; rather, the contrary is taught. Further, on page 5, lines 21-24, of Adams et al. it is taught that the polyaniline is ground with AMPSA in a glove box under dry nitrogen to avoid gelation. Clearly, Adams

et al. does not teach the addition of between 2 and 12 mass% of water to the polyaniline/AMPSA mixture thereof.

Regarding the temperature, the Examiner continued, this would have been obvious to one of ordinary skill in the art at the time the invention was made in the process of Adams et al. principally because polyaniline is generally synthesized at relatively low temperatures (e.g., about -25°C) and Adams et al. teaches (page 7, Example 3) that a pot (containing the mixture) is brought to (i.e., heated) and held at a temperature of 50 ± 5°C (i.e., the pot is heated to, and held at, a temperature of from 45°C to 55°C, which means that the pot was at a temperature below 45°C prior to heating, which includes temperatures below 35°C and down to the temperature at which polyaniline is synthesized).

Appellants fail to understand the Examiner's reference to the temperature at which polyaniline is synthesized as being in any way determinative of the temperatures resulting when a mixture polyaniline powder with AMPSA is mixed with dichloroacetic acid. On page 5, lines 29-30, of Adams et al. it is stated that: "The homogenization/protonation is appreciably exothermic." On page 7, lines 9-12, it is stated that: "The mixture was transferred immediately, without cooling, to a cylindrical dope-pot ... .", and on lines 14-16 of page 7 of Adams et al., it is stated that: "An electric heating tape was wrapped round the pot to enable it to be brought to and held at a temperature of 50 ± 5 °C, ...". Indeed, these recitations indicate that the spinning process was conducted with the **dope-pot** at between 45 °C and 55 °C, but does not teach or imply that the mixture was below 35 °C at any time during the mixing or spinning process.

Appellants respectfully believe that the Examiner is merely assuming that the mixture of the Adams et al. invention is cooler than 45 °C when it is introduced into the dope-pot. When a liquid having a given temperature is introduced into a vessel at room temperature, the vessel can never achieve the temperature of the liquid introduced thereto. For example, if the initial temperature of the liquid is higher than room temperature, the vessel will increase in temperature when the liquid is introduced thereto, while the liquid is cooled in the process. The final temperature of the liquid depends on its initial

temperature, the quantity of liquid introduced into the vessel, its specific heat, the mass of the vessel, and the specific heat of the vessel. Similarly, for the final temperature of the vessel.

The dope-pot of Adams et al. is heated solely because one end thereof is dipped into cold butyl acetate which may be too cold to permit the liquid to exit the spinneret. Appellants respectfully believe that the Examiner has clearly ignored the teachings of the present Specification which teaches that solutions were placed in contact with a cooling bath during preparation, and solids were added at a rate sufficiently slow to keep the solution temperature below about 35 °C (Please review page 11, lines 13-21, of the subject Specification, as originally filed.).

2. Appellants argue (page 10) that claim 7 recites continuously extruding a composition, and that Adams et al. does not teach or suggest continuous extrusion. The Examiner responded that Adams et al. does teach or suggest continuous extrusion (e.g., page 1, lines 1-13 and page 4, lines 26-30 refer to wet spinning and Example 3 (page 7, line 19) refers to formation of a continuous filament). Regarding the lengths cited by appellant (i.e., 10 mm, 10 mm and 29 mm), the Examiner continued that these lengths of filament are used to determine conductivity and tensile strength at break.

Appellants wish to direct the Examiner's attention to Pomfret et al., Adv. Mater. **10**, pages 1351-1353 (1998), where the wet-spinning process of Adams et al. is described in a publication. On page 1351, second column, fourth full paragraph of Pomfret et al. states as follows: "There was no uptake mechanism employed; the fiber was simply removed from the coagulant when the spinning was complete. Hence fiber characteristics vary along the fiber. Only short lengths of fiber were spun at each instance, however, causing such variations to be small." Thus, appellants respectfully maintain that Adams et al. does not teach continuous extrusion of the composition through a spinneret, only the spinning of a continuous filament.

3. Appellants argue (page 10) that Adams et al. teaches away from the presently-claimed invention because Adams et al. does not teach a temperature

that does not rise above 35°C. The Examiner responded that this temperature would have been obvious to one of ordinary skill in the art at the time the invention was made in the process of Adams et al. principally because polyaniline is generally synthesized at relatively low temperatures (e.g., about -25°C) and Adams et al. teaches (page 7, Example 3) that a pot (containing the mixture) is brought to (i.e., heated) and held at a temperature of 50 ± 5°C (i.e., the pot is heated to, and held at, a temperature of from 45°C to 55°C, which means that the pot was at a temperature below 45 °C prior to heating, which includes temperatures below 35°C and down to the temperature at which polyaniline is synthesized).

Appellants respectfully believe that a full response to the Examiner's argument concerning this ground of rejection has been presented in Section 1, hereinabove. Again, appellants respectfully make note that the temperature of the synthesis of the polyaniline powder is unrelated to the temperature of the polyaniline/AMPSA mixture with dichloroacetic acid.

4. Regarding appellant's comments with respect to Adams et al. (pages 12 and 13), there is no apparent significant temperature rise in the solution principally because Adams et al. teaches (page 7, Example 3) that a pot (containing the mixture) is brought to (i.e., heated) and held at a temperature of 50 ± 5°C (i.e., the pot is heated to, and held at, a temperature of from 45°C to 55°C, which means that the pot was at a temperature below 45°C prior to heating). Thus, the Examiner continued, even if the homogenization/protonation is appreciably exothermic, the mixture must still be heated in order to raise its temperature to at least 45° C. Again, appellants respectfully believe that the Examiner has ignored the teachings of the present invention, and refer the Examiner to appellants' response in Section 1 hereinabove.

5. Regarding appellant's comments with respect to Adams et al. (page 14), Adams et al. (page 4, lines 2-6 and 16-24) teaches that the polyaniline/AMPSA/DCAA mixture may contain additional solvents or diluents, including water.

Appellants respectfully believe that this argument by the Examiner was completely addressed in Section 1, hereinabove.

6. Regarding appellants' comments with respect to Adams et al. (pages 14 and 15), Adams et al. does not teach or suggest continuous extrusion (e.g.;, page 1, lines 1-13 and page 4, lines 26-30 refer to wet spinning and Example 3 (page 7, line 19) refers to formation of a continuous filament), the lengths cited by appellants (i.e., 10 mm, 10 mm and 29 mm) are used to determine conductivity and tensile strength at break.

Appellants respectfully believe that this argument by the Examiner was completely addressed in Section 2, hereinabove.

Appellants respectfully request that the Honorable Board of Appeals consider this reply in response to the arguments set forth in the Examiner's Answer.

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Dated this 25th day of June 2008: By:

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